

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/US2004/026632

International filing date (day/month/year)
17.08.2004

Priority date (day/month/year)
03.09.2003

International Patent Classification (IPC) or both national classification and IPC
B01J27/32, C07C2/20

Applicant
EXXONMOBIL CHEMICAL PATENTS INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

10/565143

International application No.
PCT/US2004/026632

IAP12 Rec'd PCT/PTO 19 JAN 2006

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material:
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing:
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2004/026632

Box No. II Priority

1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. ☐ It has not been possible to consider the validity of the priority claim because a copy of the priority document was not available to the ISA at the time that the search was conducted (Rule 17.1). This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

4. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-14
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-14
Industrial applicability (IA)	Yes: Claims	1-14
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1: EP-A-0 742 191 (AMOCO CORP) 13 November 1996 (1996-11-13)

D2: US-A-5 254 784 (NURMINEN MATTI ET AL) 19 October 1993 (1993-10-19)

1.1 The last part of claim 1 (... "wherein the recycle...") is a result-to-be-achieved. It may not be used to distinguish this process from prior art since it merely states the desired result without giving additional technical information. It is assumed this will inherently be the result of using a condenser column having an internal structure.

In addition almost any internal structure will increase recombination.

1.2 Consequently, in clear technical features, claim 1 reads as follows:

A process for the reduction of BF₃ emissions from a crude PAO product stream, comprising:

- (a) distilling a portion of the crude PAO,
- (b) contacting the uncomplexed BF₃ and uncomplexed organic catalyst component in a condenser column having an internal structure suitable for increasing recombination of the BF₃ and the uncomplexed organic catalyst component.

D1 discloses a process for the reduction of BF₃ emissions from a crude PAO product stream, comprising

- (a) stripping of the crude PAO/catalyst mixture in a stripper which may have trays etc.
- (b) contacting the thermal cracking gas (comprising BF₃ and uncomplexed organic catalyst component) with a cold olefin stream (which may contain more uncomplexed organic catalyst component) in an "absorber/direct-contact condensation column. This column preferably has internals, such as trays or packing, to enhance contact between the two phases". (see column 5, lines 7-19, 25-35 and column 6, lines 6-10).

1.3 The only difference between the subject-matter of claim 1 of present application and D1 is the use of distillation instead of stripping with hot gas, in order to separate the lower volatile PAO product from the more volatile catalyst components.

In the absence of surprising advantages of using distillation over stripping with hot gas for separating the heavy PAO's from the monomers and the catalyst, these are considered as equivalents which the skilled person would readily interchange if wishing

to provide an alternative process.

The subject-matter of claim 1, therefore, lacks inventive step over D1 (Art. 33(1) and (3) PCT).

1.4 None of the dependent claims contains subject-matter that is not already known from D1 or that can be considered as providing a surprising or non-obvious solution to any particular problem. Therefore, also the subject-matter of dependent claims 2-14 lacks inventive step (Art. 33(1) and (3) PCT).

2. In addition, the subject-matter of claims 1-14 also appears to lack inventive step over the combination of D2 and D2.

D2 discloses (see claim 1 and column 2, lines 22-62) a process for the reduction of BF₃ emissions from a crude PAO product stream, comprising

(a) distillation.

(b) a liquid ring vacuum pump.

wherein the fluid ring is formed by cocatalyst (alcohol), possibly assisted by a blaster to intimately mix gas and fluid. In the pump the BF₃ and cocatalyst immediately form a complex, which can be recovered and recycled.

Difference of the present application with D2 is that in the present application a condenser column with internal structure is used instead of a liquid ring vacuum pump to recombine BF₃ with the organic complex (cocatalyst).

D1 (see column 5, lines 25-35 and column 6, lines 6-37) discloses that a direct-contact condensation column and a liquid ring vacuum pump are equivalents for the same purpose of cooling and combining BF₃ with organic complexing promoter (alcohol).

Again, none of the dependent claims contains subject-matter that is not already known from D1 or that can be considered as providing a surprising or non-obvious solution to any particular problem. Therefore, also the subject-matter of dependent claims 2-14 lacks inventive step (Art. 33(1) and (3) PCT).

Re Item VIII

Certain observations on the international application

The only additional subject-matter of claim 4 is, in fact, a result to be achieved without providing any technical features causing this result-to-be-achieved.

**WRITTEN OPINION OF THE
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AUTHORITY (SEPARATE SHEET)**

International application No.

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As a result, claim 4 lacks clarity and support (Article 6 PCT).